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(54) Title: COMPOSITIONS OF ORTHOGONAL GLUTAMYL-tRNA AND AMINOACYL tRNA SYNTHETASE PAIRS AND USES THEREOF

(57) Abstract: Compositions and methods of producing components of protein biosynthetic machinery that include glutamyl orthogonal tRNAs, glutamyl orthogonal aminoacyl-tRNA synthetases, and orthogonal pairs of glutamyl tRNAs/synthetases are provided. Methods for identifying these orthogonal pairs are also provided along with methods of producing proteins using these orthogonal pairs.